

Trend Study 22-2-03

Study site name: Piute Reservoir.

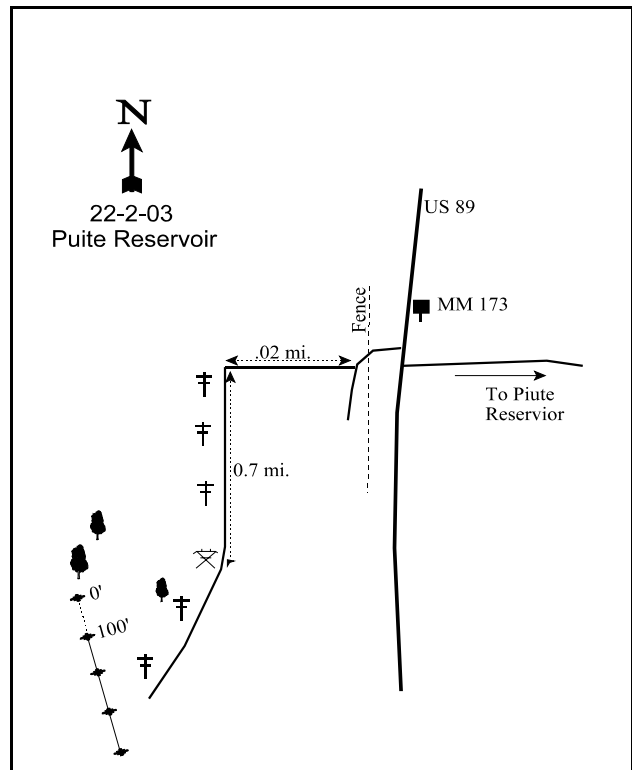
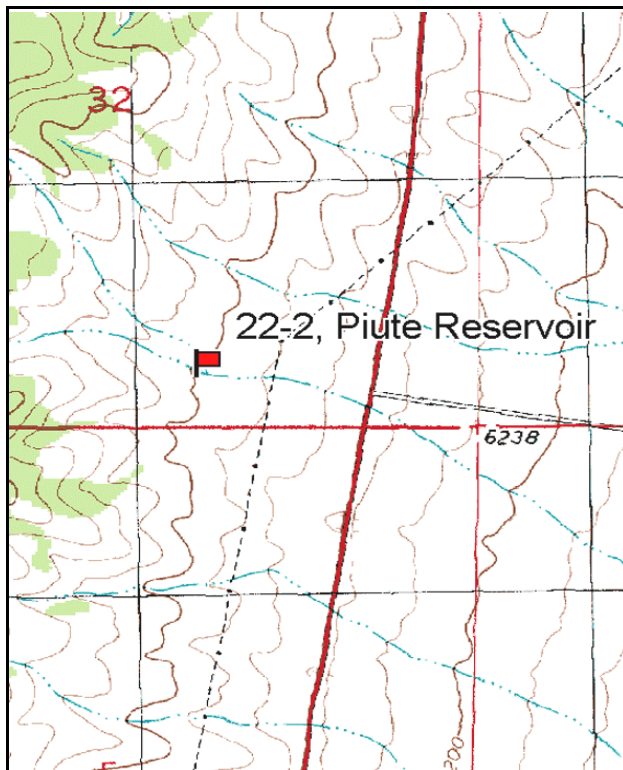
Vegetation type: Wyoming Big Sagebrush.

Compass bearing: frequency baseline 165 degrees magnetic.

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

## LOCATION DESCRIPTION

From mile marker 173 on Route 89 south of Marysville, go 0.1 miles south and turn west on a faint, grassy road. Take an immediate right after going through the fence. Proceed 0.2 miles to a fork, go left for 0.7 miles to a large steel power pole where the powerlines turn. From the steel power pole, go about 600 feet at 225 degrees magnetic between to large juniper trees to another juniper. The 0-foot end of the frequency baseline is 5 yards south of the juniper. The stakes are all rebar and the 0-foot stake has a browse tag #7080 attached.

Map Name: Piute Reservoir

### Diagrammatic Sketch

Township 29S, Range 3W, Section 5

GPS: NAD 27, UTM 12S 4242530 N, 393135 E

## DISCUSSION

### Piute Reservoir - Trend Study No. 22-2

The Piute Reservoir transect is located on BLM administered land approximately 1½ miles west of the dam and 1/4 mile west of Highway 89. The slope is gentle (2-3%) with a southeast aspect and an elevation of 6,400 feet. The range type is Wyoming big sagebrush. The study is within the Junction Cattle Allotment with joint Forest Service and BLM grazing seasons from May 1 through June 10 and November 1 through February 15 annually. Deer use occurs mainly during the winter and early spring. In 1991, it was noted that pellet groups were scattered throughout the area and one antler shed was found. In 1998, a pellet group transect on the site indicated 21 deer days use/acre (52 ddu/ha), and 5 shed deer antlers were found in the area. Pellet group transect data from 2003 estimated only 3 deer and 5 elk days use/acre (8 ddu/ha and 13 edu/ha). Lighter use in 2003 is likely due to several mild winters preceding the survey allowing deer to stay at higher elevations.

Soils are sandy loam in texture with a neutral pH (7.3). The soil is loose and infiltration rates and water holding capacity are probably quite high. Soil temperature averaged about 72°F at a depth of 14 inches in both 1998 and 2003 indicating a dry soil profile. Rock and pavement cover a high proportion of the soil surface ranging from 38% in 2003 to 59% in 1985. In 1991, small erosion rills were common on the slopes and active gullies were prominent throughout the area. In 1998, some erosion was apparent, but it did not appear to be excessive or accelerated. Soils were given a stable rating from an erosion condition class assessment in 2003 as erosion was minimal. Bare soil has steadily increased with each reading and was estimated at 27% in 2003.

The key browse on the site is Wyoming big sagebrush. Sagebrush density was estimated at 3,560 plants/acre in 1998 increasing to 4,660 plants/acre in 2003. These plants average 20 inches in height and show light to moderate hedging in all years. The lightest use on sagebrush was in 2003. Young plants were abundant in both 1985 and 1991, moderate in 1998, and few sampled in 2003. The Wyoming big sagebrush population has become mostly mature and decadent since the initial reading in 1985. Percent decadence has been moderately high since 1991, peaking at 40% in 2003. Although percent decadence increased in 2003, the proportion of decadent plants classified as dying declined from 47% to 13%. With low reproduction and increasing decadence, the Wyoming big sagebrush population could decline by the next reading. The percentage of plants in poor vigor was low in 2003 at 5%, a decrease from 31% in 1991 and 15% in 1998. Annual leader growth averaged 1.4 inches for Wyoming big sagebrush in 2003, while canopy cover averaged 17.6%.

Low rabbitbrush is also abundant on the site with an estimated density of 3,400 plants/acre in 1998 and 3,920 in 2003. Age structure is shifting to a more mature population with fewer seedling and young plants encountered in 1998 and 2003 than in previous years. Low rabbitbrush showed light to moderate use in 1985, but very little use since. A thick pinyon and juniper woodland occurs west of this transect with a few trees starting to encroach onto the flat. These trees provide good thermal and escape cover for wintering deer.

Herbaceous vegetation is sparse on this site as illustrated by a total cover of 3% or less for all surveys. Only five species of grasses have been sampled in all years. Perennial species include bottlebrush squirreltail, Indian ricegrass, a sedge, and needle-and-thread grass. All are cool season species and occur in very low densities. Cheatgrass is found on the site yet was only sampled in one or two quadrats. The forb composition is split nearly evenly between annual and perennial species. Fiddleneck was the most abundant forb species in 2003 occurring in 39% of the quadrats. An annual *Gilia* and tansy mustard were also fairly abundant in 2003. An annual ragweed was particularly abundant along washes and the disturbed roadway in 1998.

### 1985 APPARENT TREND ASSESSMENT

The soil is one of high erosion potential and soil loss is common throughout the area. Both of the prominent browse species, Wyoming big sagebrush and low rabbitbrush, appear to be increasing in the absence of competition from grasses and forbs. Sod-forming grasses are conspicuously lacking. Herbaceous species are sparse and provide very little soil protection between the shrubs. Thus, trend of both the soil and the vegetative community appear downward due in large measure to the absence of sod-forming grasses and more desirable forbs. Perhaps spring livestock grazing should be eliminated for several years.

### 1991 TREND ASSESSMENT

The soil trend is downward because of the sharp increase in percent bare ground and decrease in litter cover. This makes soil much more susceptible to erosion during high intensity summer storms. Wyoming big sagebrush and low rabbitbrush, have noted increases in their respective densities, but percent decadence has increased for sagebrush (34%). There are two more critical measurements that are of concern for this sagebrush community. This would include form class which is indicating that 29% of the plants are heavily browsed, but more importantly, the proportion of the population that are classified as having poor vigor has increased to 31%. The browse trend is slightly downward. There are very few forbs or grasses occurring on the site and most have shown declines since 1985. The trend for herbaceous understory is slightly downward. The only way to turn around this trend is to discontinue habitual spring livestock grazing.

#### TREND ASSESSMENT

soil - down (1)

browse - slightly down (2)

herbaceous understory - slightly down (2)

### 1998 TREND ASSESSMENT

The soil trend is stable, but the soil is still vulnerable to high intensity rainstorms. Percent bare ground cover is increasing, while percent rock and pavement cover combined is decreasing. The shrub interspaces are devoid of any protective ground cover due to low frequencies of herbaceous species. The browse trend is stable. There has been an increase in the percentage of decadent sagebrush plants classified as dying (47%), but there are currently enough young plants in the population to replace these individuals. Percent decadence slightly declined overall, and the percentage of plants classified with poor vigor has declined to 15%. The herbaceous understory trend is slightly upward. Perennial grass sum of nested frequency has increased from 33 in 1991 to 73 in 1998. Similarly, total perennial herbaceous sum of nested frequency has increased from 47 in 1991 to 99 in 1998.

#### TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - slightly up (4)

### 2003 TREND ASSESSMENT

Trend for soil is slightly down due to an increase in bare soil and a decrease in litter cover. Erosion remains low, but the potential for erosion is moderate with very little protective cover within the shrub interspaces. Trend for browse is stable. The key parameters for Wyoming big sagebrush are mixed. Positive changes include increased density, improved vigor, lighter use, and a decrease in the proportion of decadent plants classified as dying. However, recruitment from young plants declined and percent decadence increased to 40%. The increaser, low rabbitbrush, increased in density in 2003, although not enough to cause concern at

the present time. The herbaceous understory is stable, but sparse and in poor condition. Perennial grass frequency slightly declined while perennial forb frequency increased. Herbaceous vegetation is almost insignificant on this site. A change in management would be beneficial on this area to help stimulate herbaceous production. This might include mechanical treatment and seeding, and adjustments in the grazing system, or both.

#### TREND ASSESSMENT

soil - slightly down (2)

browse - stable (3)

herbaceous understory - stable (3)

#### HERBACEOUS TRENDS --

Management unit 22 , Study no: 2

Type	Species	Nested Frequency				Average Cover %	
		'85	'91	'98	'03	'98	'03
G	Bromus tectorum (a)	-	-	3	6	.00	.03
G	Carex spp.	-	2	1	-	.00	-
G	Oryzopsis hymenoides	3	11	11	12	.28	.22
G	Sitanion hystrix	<sub>ab</sub> 22	<sub>ab</sub> 19	<sub>b</sub> 36	<sub>a</sub> 16	.71	.16
G	Stipa comata	<sub>ab</sub> 12	<sub>a</sub> 1	<sub>b</sub> 25	<sub>ab</sub> 16	.65	.07
Total for Annual Grasses		0	0	3	6	0.00	0.03
Total for Perennial Grasses		37	33	73	44	1.65	0.46
Total for Grasses		37	33	76	50	1.65	0.50
F	Alyssum alyssoides (a)	-	-	-	3	-	.00
F	Allium spp.	-	-	-	3	-	.00
F	Ambrosia spp.	2	-	-	-	-	-
F	Amsinckia spp.	-	-	<sub>a</sub> -	<sub>b</sub> 82	-	1.93
F	Astragalus spp.	<sub>c</sub> 29	<sub>ab</sub> 5	<sub>bc</sub> 15	<sub>a</sub> -	.23	-
F	Castilleja linariaefolia	-	-	-	3	-	.03
F	Chaenactis douglasii	-	-	1	3	.00	.00
F	Collomia linearis (a)	-	-	<sub>a</sub> -	<sub>b</sub> 15	-	.04
F	Cryptantha spp.	-	-	6	-	.06	-
F	Descurainia pinnata (a)	-	-	<sub>a</sub> -	<sub>b</sub> 53	-	.41
F	Draba spp. (a)	-	-	-	1	-	.00
F	Eriogonum cernuum (a)	<sub>b</sub> 35	<sub>a</sub> 7	<sub>a</sub> 5	<sub>a</sub> 1	.01	.00
F	Gilia spp. (a)	-	-	<sub>a</sub> -	<sub>b</sub> 60	-	.21
F	Mentzelia albicaulis (a)	-	-	-	7	-	.01
F	Orobancha fasciculata	-	-	1	-	.00	-
F	Phlox longifolia	3	6	3	6	.00	.01
F	Sphaeralcea grossulariaefolia	-	-	-	1	-	.00

T y p e	Species	Nested Frequency				Average Cover %	
		'85	'91	'98	'03	'98	'03
F	Unknown forb-annual (a)	-	7	-	-	-	-
F	Unknown forb-perennial	3	3	-	-	-	-
Total for Annual Forbs		35	14	5	140	0.00	0.70
Total for Perennial Forbs		37	14	26	98	0.30	1.99
Total for Forbs		72	28	31	238	0.31	2.69

Values with different subscript letters are significantly different at alpha = 0.10

#### BROWSE TRENDS --

Management unit 22 , Study no: 2

T y p e	Species	Strip Frequency		Average Cover %	
		'98	'03	'98	'03
B	Amelanchier utahensis	1	0	-	-
B	Artemisia tridentata wyomingensis	84	90	18.43	21.65
B	Chrysothamnus viscidiflorus stenophyllus	63	61	7.55	5.90
B	Juniperus osteosperma	0	1	-	.03
B	Leptodactylon pungens	0	0	.38	-
B	Opuntia spp.	1	1	.15	-
B	Pinus edulis	2	1	.18	.41
Total for Browse		151	154	26.70	28.00

#### CANOPY COVER, LINE INTERCEPT --

Management unit 22 , Study no: 2

Species	Percent Cover  '03
Artemisia tridentata wyomingensis	17.56
Chrysothamnus viscidiflorus stenophyllus	6.26
Pinus edulis	.88

KEY BROWSE ANNUAL LEADER GROWTH --  
Management unit 22 , Study no: 2

Species	Average leader growth (in)
	'03
Artemisia tridentata wyomingensis	1.4

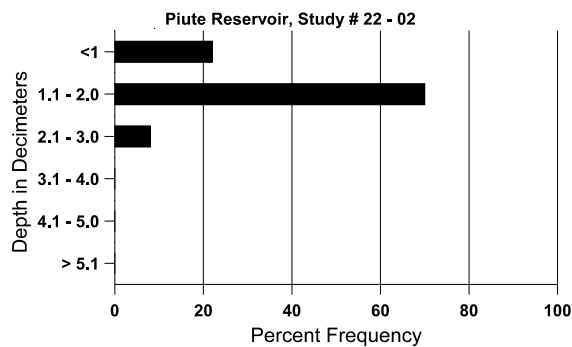
BASIC COVER --  
Management unit 22 , Study no: 2

Cover Type	Average Cover %			
	'85	'91	'98	'03
Vegetation	3.00	4.25	29.79	30.15
Rock	.75	3.25	3.83	6.93
Pavement	58.50	48.75	43.54	31.50
Litter	29.25	24.25	26.39	17.25
Cryptogams	0	.25	.15	.15
Bare Ground	8.50	19.25	21.88	27.26

SOIL ANALYSIS DATA --  
Management unit 22, Study no: 2, Study Name: Piute Reservoir

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	ds/m
14.2	72.0 (14.7)	7.3	68.0	17.4	14.6	3.9	16.2	332.8	0.9

## Stoniness Index



PELLET GROUP DATA --

Management unit 22 , Study no: 2

Type	Quadrat Frequency		Days use per acre (ha)	
	'98	'03	'98	'03
Rabbit	11	10	-	-
Elk	-	2	-	5 (13)
Deer	6	1	21 (52)	3 (8)

BROWSE CHARACTERISTICS --

Management unit 22 , Study no: 2

		Age class distribution (plants per acre)					Utilization				
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
<b>Amelanchier utahensis</b>											
85	<b>0</b>	-	-	-	-	-	0	0	0	0	-/-
91	<b>0</b>	-	-	-	-	-	0	0	0	0	-/-
98	<b>20</b>	-	-	-	20	-	0	0	100	0	-/-
03	<b>0</b>	-	-	-	-	-	0	0	0	0	-/-
<b>Artemisia tridentata wyomingensis</b>											
85	<b>6799</b>	2733	2333	3200	1266	-	49	9	19	3	20/24
91	<b>6932</b>	66	2666	1933	2333	-	37	29	34	31	18/25
98	<b>3560</b>	140	500	2040	1020	340	44	4	29	15	20/33
03	<b>4660</b>	-	60	2740	1860	540	8	.42	40	5	20/29
<b>Cercocarpus ledifolius</b>											
85	<b>0</b>	-	-	-	-	-	0	0	-	0	-/-
91	<b>66</b>	-	-	66	-	-	100	0	-	0	11/5
98	<b>0</b>	-	-	-	-	-	0	0	-	0	-/-
03	<b>0</b>	-	-	-	-	-	0	0	-	0	-/-
<b>Chrysothamnus viscidiflorus stenophyllus</b>											
85	<b>2133</b>	10066	800	933	400	-	13	13	19	3	13/9
91	<b>2266</b>	-	800	1400	66	-	0	3	3	6	12/8
98	<b>3400</b>	260	240	2660	500	20	0	2	15	5	12/13
03	<b>3920</b>	-	60	2420	1440	40	0	0	37	1	12/15
<b>Juniperus osteosperma</b>											
85	<b>0</b>	-	-	-	-	-	0	0	-	0	-/-
91	<b>0</b>	-	-	-	-	-	0	0	-	0	-/-
98	<b>0</b>	20	-	-	-	-	0	0	-	0	-/-
03	<b>20</b>	-	20	-	-	-	0	0	-	0	-/-

		Age class distribution (plants per acre)					Utilization				
Y e a r	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
Opuntia spp.											
85	<b>66</b>	-	-	66	-	-	0	0	-	0	5/9
91	<b>66</b>	-	-	66	-	-	0	0	-	0	5/8
98	<b>20</b>	-	-	20	-	-	0	0	-	0	-/-
03	<b>20</b>	-	-	20	-	-	0	0	-	0	5/5
Pinus edulis											
85	<b>0</b>	-	-	-	-	-	0	0	-	0	-/-
91	<b>0</b>	-	-	-	-	-	0	0	-	0	-/-
98	<b>40</b>	-	20	20	-	-	0	0	-	0	-/-
03	<b>20</b>	-	-	20	-	-	0	0	-	0	-/-